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NEWS 3	Oct 09	Korean abstracts now included in Derwent World Patents Index
NEWS 4	Oct 09	Number of Derwent World Patents Index updates increased
NEWS 5	Oct 15	Calculated properties now in the REGISTRY/ZREGISTRY File
NEWS 6	Oct 22	Over 1 million reactions added to CASREACT
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NEWS 8	Oct 29	AAASD no longer available
NEWS 9	Nov 19	New Search Capabilities USPATFULL and USPAT2
NEWS 10	Nov 19	TOXCENTER(SM) - new toxicology file now available on STN
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NEWS 12	Nov 29	DWPI revisions to NTIS and US Provisional Numbers
NEWS 13	Nov 30	Files VETU and VETB to have open access
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NEWS 17	Dec 17	STANDARDS now available on STN
NEWS 18	Dec 17	New fields for DPCI
NEWS 19	Dec 19	CAS Roles modified
NEWS 20	Dec 19	1907-1946 data and page images added to CA and CAplus
NEWS 21	Jan 25	BLAST(R) searching in REGISTRY available in STN on the Web
NEWS 22	Jan 29	Searching with the P indicator for Preparations
NEWS 23	Jan 29	FSTA has been reloaded and moves to weekly updates
NEWS 24	Feb 01	DKILIT now produced by FIZ Karlsruhe and has a new update frequency
NEWS 25	Feb 19	Access via Tymnet and SprintNet Eliminated Effective 3/31/02
NEWS 26	Mar 08	Gene Names now available in BIOSIS

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FILE 'HOME' ENTERED AT 14:51:13 ON 19 MAR 2002

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FILE 'FSTA' ENTERED AT 14:51:30 ON 19 MAR 2002
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FILE 'FROSTI' ENTERED AT 14:51:30 ON 19 MAR 2002
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=> s transglutaminase#
L1 770 TRANSGLUTAMINASE#

=> s cheese#
L2 45611 CHEESE#

=> s l1 and l2
L3 50 L1 AND L2

=> s shap? or struc?
L4 67425 SHAP? OR STRUC?

=> s l3 and l4
L5 2 L3 AND L4

=> d 1-2 all

L5 ANSWER 1 OF 2 FROSTI COPYRIGHT 2002 LFRA
AN 438976 FROSTI
TI Enzymatic modification of food proteins to improve the functional properties.
AU Kamata Y.
SO Food proteins and lipids: proceedings of a symposium, Chicago, August 1995., Published by: Plenum Press, New York, 1997, 47-65 (52 ref.)
Damodaran S.
ISBN: 0-306-45586-2
DT Conference Article
LA English
AB An increased demand for meat products in Asia has resulted in the development of vegetable or milk protein-based simulated meat products. As the functional properties of milk and vegetable proteins are often inferior to animal proteins, improvements to the functional quality of milk and vegetable proteins are required. Improvements can be made by modifying the proteins. In this paper, the enzymic modification of milk and vegetable proteins is discussed. Consideration is given to partial proteolysis of soya bean glycinin (the effects of partial proteolysis on the **structure** and functional properties, such as emulsifying properties, of glycinin); partial proteolysis in the production of soya milk **cheese**; immobilized enzyme systems (enzymic cross-linking using **transglutaminase** and enzymic cross-linkage between advanced glycosylated end-products of the browning reaction with other proteins, e.g. using glycosylated egg-white beads); and protein-chitosan systems.
SH PROTEINS
CT CHITOSAN; CROSS LINKING; ENZYMES; FUNCTIONAL PROPERTIES; GLYCININ;

IMMOBILIZED ENZYMES; IMPROVEMENTS; MODIFICATION; PROTEINS; PROTEOLYSIS; SOYA MILK **CHEESE**
DED 1 Jul 1997

L5 ANSWER 2 OF 2 FROSTI COPYRIGHT 2002 LFRA
AN 418131 FROSTI
TI A cross-linking approach for studying mutual spatial relationships of protein components in **cheese**.
AU Righi A.; Turin L.; Bonomi F.
SO Milchwissenschaft, 1996, 51 (8), 442-446 (20 ref.)
DT Journal
LA English
SL English; German
AB Cross-linkages between amino acid side chains of proteins may be formed by the enzyme **transglutaminase** or by other molecules containing two reactive groups. This paper reports the use of glutaraldehyde for cross-linking casein micelle protein components in milk and in commercial **cheese** samples. In raw milk, alpha(s)-casein and beta-casein had similar reactivities with glutaraldehyde, but whey proteins were unreactive. In the **cheeses** studied (Mozzarella, Caciotta, Taleggio, and processed **cheese**), beta-casein and para-kappa-casein were sensitive indicators of changes in micellar **structure** during **cheese** ripening.
SH DAIRY PRODUCTS
CT CASEIN; CASEIN MICELLES; **CHEESE**; CROSS LINKING; GLUTARALDEHYDE; MICELLES; MILK; MILK PROTEIN; MILK PROTEINS; PROTEINS; RIPENING; **STRUCTURE**; TYPE
DED 19 Sep 1996

=> d his

(FILE 'HOME' ENTERED AT 14:51:13 ON 19 MAR 2002)

FILE 'FSTA, FROSTI' ENTERED AT 14:51:30 ON 19 MAR 2002
L1 770 S TRANSGLUTAMINASE#
L2 45611 S CHEESE#
L3 50 S L1 AND L2
L4 67425 S SHAP? OR STRUC?
L5 2 S L3 AND L4

=> s l2/ti
L6 23745 L2/TI

=> s l3 and l6
L7 21 L3 AND L6

=> d 1-21 all

L7 ANSWER 1 OF 21 FSTA COPYRIGHT 2002 IFIS
AN 2002:P0501 FSTA
TI **Cheese** whey protein having improved texture process for producing the same and use thereof.
IN Soeda, T.
PA Soeda, Kawasaki-shi, Japan
SO United States Patent Application Publication, (2001)
PI US 2001053398 A1
PRAI JP 1998-176988 19980624
DT Patent
LA English
AB A process for producing a modified **cheese** whey protein is described. Initially, the pH of an aqueous whey protein solution is made

alkaline and/or the solution is heated. Then, the whey protein is treated with a **transglutaminase** (protein-glutamine .gamma.-glutamyl transferase).
CC P (Milk and Dairy Products)
CT PATENTS; PROTEINS MILK; WHEY; MODIFICATION; WHEY PROTEINS

L7 ANSWER 2 OF 21 FSTA COPYRIGHT 2002 IFIS
AN 2001(12):P1840 FSTA
TI Incorporation of whey into process **cheese**.
IN Xiao-Qing Han; Spradlin, J. E.
PA Kraft Foods, Northfield, IL, USA
SO United States Patent, (2001)
PI US 6270814 B1
PRAI US @@@@-325220 19990603
DT Patent
LA English
AB A processed **cheese** product is described, made with **cheese** and dairy liquid containing casein, whey protein and lactose. A portion of the casein and/or whey protein in the dairy liquid is crosslinked via .gamma.-carboxyl-.epsilon.-amino linkages before being combined with the **cheese**. The lactose in the processed **cheese** product remains dissolved in the aqueous phase upon storage. The process used to prepare the **cheese** includes a step in which the dairy liquid is exposed to **transglutaminase** under conditions which allow crosslinking of casein and/or whey protein to take place. Also described is the process for manufacture of the **cheese** product, which includes replacement of some of the **cheese** proteins with the crosslinked protein conjugates in the dairy liquid. Crystallization of lactose in the processed **cheese** is inhibited, resulting in higher lactose levels than those normally introduced into **cheese** products.
CC P (Milk and Dairy Products)
CT CASEIN; **CHEESE VARIETIES**; LACTOSE; PATENTS; PROTEINS MILK; WHEY; **PROCESSED CHEESE**; WHEY PROTEINS

L7 ANSWER 3 OF 21 FSTA COPYRIGHT 2002 IFIS
AN 2001(08):P1370 FSTA
TI Process for incorporating whey proteins into **cheese** using **transglutaminase**.
IN Xiao-Qing Han; Spradlin, J. E.
PA Kraft Foods Inc.; Kraft Foods, Northfield, IL, USA
SO United States Patent, (2001)
PI US 6224914 B1
PRAI US @@@@-325217 19990603
DT Patent
LA English
AB A **cheese** curd is described which contains a substantial proportion of whey protein products and curded proteins originating from a dairy liquid containing casein. Also described is a process for making the **cheese** curd, which involves contact between a dairy liquid fortified with whey protein and a **transglutaminase** (protein-glutamine .gamma.-glutamyltransferase), providing a modifed dairy liquid containing whey protein products. This liquid is then blended with a second dairy liquid and renneted to provide a curd in which a high proportion of whey protein products is retained. The curd can then be used to prepare **cheese** products, including soft, semi-soft and hard **cheeses** which contain substantial amounts of whey protein products and curded proteins originating from dairy liquids.
CC P (Milk and Dairy Products)
CT CHEESEMAKING; CURD; PATENTS; PROTEINS MILK; TRANSFERASES; WHEY; **CHEESE CURD**; PROTEIN-GLUTAMINE Nd -GLUTAMYLTRANSFERASES; WHEY PROTEINS

L7 ANSWER 4 OF 21 FSTA COPYRIGHT 2002 IFIS
AN 2000(05):G0212 FSTA
TI **Cheese** whey protein having improved texture, process for producing the same and use thereof.
IN Soeda, T.
PA Ajinomoto Co. Inc.; Ajinomoto, Tokyo, Japan
SO European Patent Application, (1999)
PI EP 966887 A1
PRAI JP 1998-176983 19980624
DT Patent
LA English
AB A process is described for modification of **cheese** whey protein by partially denaturing the protein and treating it with **transglutaminase**. The protein is subjected to pH adjustment and preheating before **transglutaminase** treatment. When the treated **cheese** whey protein is subsequently heated at .gtoreq.100.degree.C, insolubilization of the protein by aggregation does not occur. A gel made from the treated whey protein or foods made with this protein can have excellent texture and maintain good emulsifiability, foamability and water holding capacity.
CC G (Catering, Speciality and Multicomponent Foods)
CT FUNCTIONAL PROPERTIES; PATENTS; PROTEINS MILK; TEXTURE; TRANSFERASES; WHEY; MODIFICATION; PROTEIN-GLUTAMINE Nd -GLUTAMYLTRANSFERASES; WHEY PROTEINS

L7 ANSWER 5 OF 21 FSTA COPYRIGHT 2002 IFIS
AN 1997(11):P0182 FSTA
TI A process for making **cheese**.
IN Budtz, P.
PA Novo Nordisk A/S; Novo Nordisk, Novo Alle, DK-2880 Bagsvaerd, Denmark
SO PCT International Patent Application, (1997)
PI WO 9701961 A1
PRAI DK 1995-764 19950630
DT Patent
LA English
AB A process for manufacturing **cheese** and the products obtained from this process are described. **Transglutaminase** is added to cheesemaking milk and incubated with a rennet so as to cause clotting. Whey is separated from the coagulate and the coagulate is processed into **cheese**. The use of **transglutaminase** for maintaining proteins in **cheese** during a conventional cheesemaking process is also described. [From En summ.]
CC P (Milk and Dairy Products)
CT CHEESEMAKING; ENZYMES; PATENTS; PROCESSING; TRANSFERASES; **TRANSGLUTAMINASES**

L7 ANSWER 6 OF 21 FROSTI COPYRIGHT 2002 LFRA
AN 563782 FROSTI
TI Incorporation of whey into process **cheese**.
IN Han X.-Q.; Spradlin J.E.
PA Kraft Foods Inc.
SO United States Patent
PI US 6270814 B 20010807
AI 19990603
NTE 20010807
DT Patent
LA English
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FILE 'FSTA, FROSTI' ENTERED AT 14:51:30 ON 19 MAR 2002
L1 770 S TRANSGLUTAMINASE#
L2 45611 S CHEESE#
L3 50 S L1 AND L2
L4 67425 S SHAP? OR STRUC?
L5 2 S L3 AND L4
L6 23745 S L2/TI
L7 21 S L3 AND L6

=> d l3 1-50 all

L3 ANSWER 1 OF 50 FSTA COPYRIGHT 2002 IFIS
AN 2002:P0501 FSTA
TI **Cheese** whey protein having improved texture process for producing the same and use thereof.
IN Soeda, T.
PA Soeda, Kawasaki-shi, Japan
SO United States Patent Application Publication, (2001)
PI US 2001053398 A1
PRAI JP 1998-176988 19980624
DT Patent
LA English
AB A process for producing a modified **cheese** whey protein is described. Initially, the pH of an aqueous whey protein solution is made alkaline and/or the solution is heated. Then, the whey protein is treated with a **transglutaminase** (protein-glutamine .gamma.-glutamyl transferase).
CC P (Milk and Dairy Products)
CT PATENTS; PROTEINS MILK; WHEY; MODIFICATION; WHEY PROTEINS

L3 ANSWER 2 OF 50 FSTA COPYRIGHT 2002 IFIS
AN 2001(12):P1840 FSTA
TI Incorporation of whey into process **cheese**.
IN Xiao-Qing Han; Spradlin, J. E.
PA Kraft Foods, Northfield, IL, USA
SO United States Patent, (2001)
PI US 6270814 B1
PRAI US @@@@-325220 19990603
DT Patent
LA English
AB A processed **cheese** product is described, made with **cheese** and dairy liquid containing casein, whey protein and lactose. A portion of the casein and/or whey protein in the dairy liquid is crosslinked via .gamma.-carboxyl-.epsilon.-amino linkages before being combined with the **cheese**. The lactose in the processed **cheese** product remains dissolved in the aqueous phase upon storage. The process used to prepare the **cheese** includes a step in which the dairy liquid is exposed to **transglutaminase** under conditions which allow crosslinking of casein and/or whey protein to take place. Also described is the process for manufacture of the **cheese** product, which includes replacement of some of the **cheese** proteins with the crosslinked protein conjugates in the dairy liquid. Crystallization of lactose in the processed **cheese** is inhibited, resulting in higher lactose levels than those normally introduced into **cheese** products.
CC P (Milk and Dairy Products)
CT CASEIN; **CHEESE VARIETIES**; LACTOSE; PATENTS; PROTEINS MILK; WHEY; **PROCESSED CHEESE**; WHEY PROTEINS

L3 ANSWER 3 OF 50 FSTA COPYRIGHT 2002 IFIS

AN 2001(08):P1370 FSTA
TI Process for incorporating whey proteins into **cheese** using **transglutaminase**.
IN Xiao-Qing Han; Spradlin, J. E.
PA Kraft Foods Inc.; Kraft Foods, Northfield, IL, USA
SO United States Patent, (2001)
PI US 6224914 B1
PPAI US @@@@-325217 19990603
DT Patent
LA English
AB A **cheese** curd is described which contains a substantial proportion of whey protein products and curded proteins originating from a dairy liquid containing casein. Also described is a process for making the **cheese** curd, which involves contact between a dairy liquid fortified with whey protein and a **transglutaminase** (protein-glutamine .gamma.-glutamyltransferase), providing a modifed dairy liquid containing whey protein products. This liquid is then blended with a second dairy liquid and renneted to provide a curd in which a high proportion of whey protein products is retained. The curd can then be used to prepare **cheese** products, including soft, semi-soft and hard **cheeses** which contain substantial amounts of whey protein products and curded proteins originating from dairy liquids.
CC F (Milk and Dairy Products)
CT CHEESEMAKING; CURD; PATENTS; PROTEINS MILK; TRANSFERASES; WHEY; **CHEESE CURD**; PROTEIN-GLUTAMINE Nd -GLUTAMYLTRANSFERASES; WHEY PROTEINS

L3 ANSWER 4 OF 50 FSTA COPYRIGHT 2002 IFIS
AN 2000(11):B1811 FSTA
TI Enzyme builds links to creative products.
AU Ohr, L. M.
SO Prepared Foods, (2000), 169 (6) 75
ISSN: 0747-2536
DT Journal
LA English
AB A novel **transglutaminase** (Activa.sup.T.sup.M TG; protein-glutamine .gamma.-glutamyltransferase) enzyme, developed by Ajinomoto USA Inc. and approved for use in meat, poultry, sea food and **cheese**, is discussed. This enzyme can be used to crosslink proteins, e.g. caseinate, and to join 2 different proteins, thus allowing synthesis of `designer' proteins. It can also be used to restructure products such as the trim from steak, which can be restructured into a portionable form by treatment with TG-RM, a combination of the **transglutaminase**, caseinate and maltodextrin. Other forms include TG-TI which can be used to improve texture of products, such as meat and dairy products, and TG-SF which consists of **transglutaminase**, maltodextrin, starch and sodium phosphate and which can be used to modify texture of sea food. Plans for additional preparations which can be used in a variety of other foods are also discussed.
CC B (Biotechnology)
CT TRANSFERASES; FOODS; PROTEIN-GLUTAMINE Nd -GLUTAMYLTRANSFERASES
TN Activa TG; Ajinomoto USA Inc.

L3 ANSWER 5 OF 50 FSTA COPYRIGHT 2002 IFIS
AN 2000(05):G0212 FSTA
TI **Cheese** whey protein having improved texture, process for producing the same and use thereof.
IN Soeda, T.
PA Ajinomoto Co. Inc.; Ajinomoto, Tokyo, Japan
SO European Patent Application, (1999)
PI EP 966887 A1
PPAI JP 1998-176988 19980624

DT Patent
LA English
AB A process is described for modification of **cheese** whey protein by partially denaturing the protein and treating it with **transglutaminase**. The protein is subjected to pH adjustment and preheating before **transglutaminase** treatment. When the treated **cheese** whey protein is subsequently heated at .gtoreq.100.degree.C, insolubilization of the protein by aggregation does not occur. A gel made from the treated whey protein or foods made with this protein can have excellent texture and maintain good emulsifiability, foamability and water holding capacity.
CC G (Catering, Speciality and Multicomponent Foods)
CT FUNCTIONAL PROPERTIES; PATENTS; PROTEINS MILK; TEXTURE; TRANSFERASES; WHEY; MODIFICATION; PROTEIN-GLUTAMINE Nd -GLUTAMYLTRANSFERASES; WHEY PROTEINS

L3 ANSWER 6 OF 50 FSTA COPYRIGHT 2002 IFIS
AN 1999(10):P1408 FSTA
TI Properties and potential fields of application of **transglutaminase** preparations in dairying.
AU Lorenzen, P. C.; Schlimme, E.
CS International Dairy Federation Enzymes in Dairying Symposium; Fed. Dairy Res. Cent., PO Box 6069, D-24121 Kiel, Germany
SO Bulletin of the International Dairy Federation, (1998), No. 332, 47-53, 37 ref.
ISSN: 0250-5118
DT Conference
LA English
AB Properties of **transglutaminase** and its possible use in manufacture of dairy products are discussed. Aspects covered include: reactions catalysed by the enzyme and properties of modified proteins; and effects of crosslinking on the properties of selected milk proteins and products (enzymic crosslinking of sodium caseinate by **transglutaminase**, effects of crosslinking on the texture of yoghurt, rennetability of skim milk and physical properties of whipping cream). It is suggested that potential fields of application of **transglutaminase** in the dairy industry include stabilizing products such as yoghurt, whipping cream, fresh **cheese** and novel products (e.g. spreads, low calorie foods), and preparation of crosslinked caseinates as functional ingredients. Non-food uses of **transglutaminases** are also mentioned. [Further papers presented at this symposium are covered in electronic formats of the FSTA database and may be traced via the corporate authors (CA) field, under International Dairy Federation [Enzymes in Dairying Symposium]. See also 1999-Pa1354.]
CC P (Milk and Dairy Products)
CT DAIRY PRODUCTS; PROTEINS; PROTEINS MILK; TRANSFERASES; MILK PROTEINS; MODIFICATION; **TRANSGLUTAMINASES**

L3 ANSWER 7 OF 50 FSTA COPYRIGHT 2002 IFIS
AN 1999(09):S1427 FSTA
TI Ingredients that get to the meat of the matter.
AU Fszczola, D. E.
SO Food Technology, (1999), 53 (4) 62-64, 66, 68
ISSN: 0015-6639
DT Journal
LA English
AB Developments in additives for improving quality of meat products are described. Aspects considered include: whey protein films for improved quality (moisture, freshness, cooking yields and integrity) of hot dogs and processed meats; dried plum puree for retained moisture and improved freshness in meat products (including hamburgers, hot dogs, turkey

meatballs, turkey sausage and pizza toppings); coconut concentrate for improved flavour development in savoury applications (e.g. sauces, dressings/dips, marinades, glazes and soups); use of Streptoverticillium mobaraense **transglutaminase** for restructuring of meat, poultry and fish products (including restructured steak, boneless ham, pork loin ham, roasted pork, hot dogs, sausages, nuggets and seafood pate) for improved firmness, moisture retention, texture and mouthfeel; textured wheat proteins for use as extenders and replacers to reduce costs and improve textures and flavour profiles in meat and poultry products (including chicken, beef and fish patties, chicken salad, meatballs, meat loaf, chicken nuggets, beef mince, bologna, sausage, jerky, surimi); hydrophobic surface coating to improve melt and flow properties of low fat/fat free **cheese** melts for use on patties; honey for reduced oxidation and improved flavour quality in meat and poultry; salt alternative for reduced sodium levels in meat and poultry products; and labelling of organic meat and poultry.

CC S (Meat, Poultry and Game)

CT ADDITIVES; MEAT PRODUCTS; POULTRY MEAT; DEVELOPMENTS; POULTRY PRODUCTS; QUALITY

L3 ANSWER 8 OF 50 FSTA COPYRIGHT 2002 IFIS

AN 1998(02):P0205 FSTA

TI Pilot studies on the effect of enzymatic crosslinking in dairying.

AU Lorenzen, P. C.; Schlimme, E.

CS Inst. for Chem. & Physics, Fed. Dairy Res. Cent., PO Box 60 69, D-24121 Kiel, Germany

SO Kieler Milchwirtschaftliche Forschungsberichte, (1997), 49 (3) 221-227, 24 ref.
ISSN: 0023-1347

DT Journal

LA English

SL German; French

AB The paper describes properties and selected application fields of the enzyme **transglutaminase** [EC 2.3.2.13] in dairying. Results of pilot studies and application fields suggest that the stabilization of products like yoghurt, whipping cream and fresh **cheese** are of interest. The preparation and utilization of crosslinked caseinates as functional ingredients in food systems may also be worthwile. However, extensive studies are necessary to get a better understanding of crosslinking in dairying. Potential non-food uses of **transglutaminase** include the preparation of foils/films, coating, medical polymers and carriers for immobilizing enzymes.

CC P (Milk and Dairy Products)

CT DAIRY PRODUCTS; TRANSFERASES; **TRANSGLUTAMINASES**

L3 ANSWER 9 OF 50 FSTA COPYRIGHT 2002 IFIS

AN 1997(11):P0182 FSTA

TI A process for making **cheese**.

IN Budtz, P.

PA Novo Nordisk A/S; Novo Nordisk, Novo Alle, DK-2880 Bagsvaerd, Denmark

SO PCT International Patent Application, (1997)

PI WO 9701961 A1

PRAI DK 1995-764 19950630

DT Patent

LA English

AB A process for manufacturing **cheese** and the products obtained from this process are described. **Transglutaminase** is added to cheesemaking milk and incubated with a rennet so as to cause clotting. Whey is separated from the coagulate and the coagulate is processed into **cheese**. The use of **transglutaminase** for maintaining proteins in **cheese** during a conventional cheesemaking process is also described. [From En summ.]

CC P (Milk and Dairy Products)
CT CHEESEMAKING; ENZYMES; PATENTS; PROCESSING; TRANSFERASES; **TRANSGLUTAMINASES**

L3 ANSWER 10 OF 50 FSTA COPYRIGHT 2002 IFIS
AN 1995(03):P0130 FSTA
TI Method for production of an acidified edible gel on milk basis, and use of such gel.
IN Budolfsen, G.; Nielsen, P. M.
PA Novo Nordisk A/S; Novo Nordisk, DK-2880 Bagsvaerd, Denmark
SO PCT International Patent Application, (1994)
PI WO 9421129 A1
PPAI DK 1993-312 19930319
DT Patent
LA English
AB **Transglutaminase** is added to milk and the mixture is heat treated to produce a functionally and/or organoleptically acceptable acidified gel, which can be used as a yoghurt mousse or **cheese**. [From En summ.]
CC P (Milk and Dairy Products)
CT DAIRY PRODUCTS; GELS; MILK; PATENTS

L3 ANSWER 11 OF 50 FSTA COPYRIGHT 2002 IFIS
AN 1991(05):V0004 FSTA
TI Novel **transglutaminase**.
IN Motoki, M.; Okiyama, A.; Nonaka, M.; Tanaka, H.; Uchio, R.; Matsuura, A.; Ando, H.; Umeda, K.
PA Ajinomoto Co. Inc.; Amano Pharmaceutical Co. Ltd.; Ajinomoto, Tokyo 104, Japan
SO European Patent Application, (1990)
PI EP 379606 A1
PPAI EP 1989-101143 19890123
DT Patent
LA English
AB Process is described for producing a **transglutaminase** catalysing an acyl transfer reaction of a .gamma.-carboxyamide group of a glutamine residue in a peptide or protein chain in the absence of Ca.sup.2.sup.+. The process involves culturing specifically a bacterium of the genus Streptoverticillium. Specific application is to the manufacture of gelation products, e.g. yoghurt, **cheese** and jellies.
CC V (Patents)
CT BACTERIA; CELL CULTURE; ENZYMES; GELATION; HYDROLASES; PATENTS; ACTINOMYCETALES; CULTURE

L3 ANSWER 12 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 576608 FROSTI
TI Enzymes in the manufacture of dairy products.
AU Law B.A.
SO Enzymes in food technology., Published by: Sheffield Academic Press, Sheffield, 2002, 91-108 (34 ref.)
Whitehurst R.J.; Law B.A.
ISBN: 1-84127-223-X
DT Book Article
LA English
AB Enzymes are traditionally used in the manufacture of dairy products. The best-known dairy enzyme is rennet, which is used for milk clotting. Rennet is traditionally obtained from calf stomachs. Milk-clotting coagulants are also obtained from vegetable, microbial and genetically modified organism sources. The main characteristics and production of rennets and coagulants from different sources are outlined. Lactoperoxidase is used to preserve milk before consumption. The commercially available enzyme preparations used for **cheese**

ripening are described. The problems associated with enzyme addition to **cheeses** are considered. Enzyme-modified **cheese** technology is described. Lysozyme is used as an alternative control agent to potassium nitrate for late blowing of **cheeses** with eyes. **Transglutaminase** has been investigated as a method of improving the texture and shelf life of yoghurt. Lipases are used in **cheese** flavour technology and to produce modified milk fat products. Lactase is used as a remedy for lactose intolerance.

SH DAIRY PRODUCTS

CT **CHEESE**; COAGULANTS; COMMERCIAL ENZYMES; DAIRY PRODUCTS; ENZYME MODIFIED **CHEESE**; ENZYMES; FERMENTED DAIRY PRODUCTS; FERMENTED FOODS; FLAVOUR; LACTASE; LACTOPEROXIDASE; LIPASES; LYSOZYME; MICROBIAL ENZYMES; RENNET; REVIEW; RIPENING; SENSORY PROPERTIES; **TRANSGLUTAMINASE**; YOGHURT

DED 11 Mar 2002

L? ANSWER 13 OF 50 FROSTI COPYRIGHT 2002 LFRA

AN 563782 FROSTI

TI Incorporation of whey into process **cheese**.

IN Han X.-Q.; Spradlin J.E.

PA Kraft Foods Inc.

SO United States Patent

PI US 6270814 B 20010807

AI 19990603

NTE 20010807

DT Patent

LA English

SL English

AB A processed **cheese** has increased content of whey proteins and lactose. The whey and milk proteins are crosslinked through the action of **transglutaminase** prior to blending with **cheese**.

SH DAIRY PRODUCTS

CT **CHEESE**; CROSS LINKING; DAIRY PRODUCTS; ENZYMES; MILK PROTEIN; PATENT; PROCESSED **CHEESE**; PROTEIN; **TRANSGLUTAMINASE**; US PATENT; WHEY PROTEIN

DED 25 Sep 2001

L3 ANSWER 14 OF 50 FROSTI COPYRIGHT 2002 LFRA

AN 560530 FROSTI

TI Process for making **cheese**.

IN Budtz P.

PA Novozymes A/S Patents

SO United States Patent

PI US 6258390 B 20010710
WO 9701961 19970123

AI 19971215

PRAI Denmark 19950630

NTE 20010710

DT Patent

LA English

SL English

AB The patent describes a method for making **cheese** from cheesemilk that has been pretreated with an enzyme, which is able to maintain proteins in the **cheese** material during the **cheese** -making process, so that increased yields of **cheese** are obtained. The enzyme used is **transglutaminase**, which is capable of increasing the amount of protein left in the coagulated **cheese** material after incubation with rennet, and after the separation of whey from coagulate. The method involves adding **transglutaminase** to cheesemilk and incubating for a suitable period; incubating with rennet to cause clotting; separating the whey from the coagulate; and processing the coagulate into **cheese**.

SH DAIPY PRODUCTS
CT **CHEESE**; DAIRY PRODUCTS; ENZYMES; INCREASE; PATENT; PRODUCTION; PROTEIN; QUANTITY; **TRANSGLUTAMINASE**; US PATENT; YIELD
DED 10 Aug 2001

L3 ANSWER 15 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 559885 FROSTI
TI **Cheese** curd made using **transglutaminase** and a non-rennet protease.
IN Han X.-Q.; Spradlin J.E.
PA Kraft Foods Inc.
SO United States Patent
PI US 6242036 B 20010605
AI 20000605
NTE 20010605
DT Patent
LA English
SL English
AB **Cheese** curd made using **transglutaminase** and a non-rennet protease is described. A dairy liquid containing casein and whey protein is treated with **transglutaminase** and a non-rennet protease. The **cheese** curd obtained contains most of the whey protein products. The process may also be used to prepare **cheese** that contains whey protein products.
SH DAIRY PRODUCTS
CT CASEIN; **CHEESE**; **CHEESE** CURD; DAIRY PRODUCTS; ENZYMES; MILK PROTEINS; NON RENNET PROTEINASES; PATENT; PROTEINASES; PROTEINS; **TRANSGLUTAMINASE**; US PATENT; WHEY PROTEIN PRODUCTS
DED 7 Aug 2001

L3 ANSWER 16 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 555513 FROSTI
TI Process for incorporating whey proteins into **cheese** using **transglutaminase**.
IN Han X.-Q.; Spradlin J.E.
PA Kraft Foods Inc.
SO United States Patent
PI US 6224914 B
AI 19990603
DT Patent
LA English
SL English
AB A **cheese** curd contains a substantial amount of whey protein products and curded proteins originating from a dairy liquid comprising casein. The whey protein is modified using **transglutaminase**, which is then blended with a second dairy liquid and renneted to produce the curd. The curd can be used to prepare **cheese** products.
SH DAIRY PRODUCTS
CT CASEIN; **CHEESE** PRODUCTS; CURD; DAIRY PRODUCTS; ENZYMES; MILK PROTEIN; MILK PROTEINS; PATENT; PROTEIN; PROTEINS; **TRANSGLUTAMINASE**; US PATENT; WHEY PROTEINS
DED 14 Jun 2001

L3 ANSWER 17 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 554504 FROSTI
TI Enzymes in the food processing industry.
AU West S.
SO Food Ingredients and Analysis International, 2001, (March-April), 23 (2), 39-41 (0 ref.)
DT Journal
LA English
SL English

AB Traditionally, the food industry has used enzymes in two areas: in **cheese** manufacture and in dextrin and sugar syrup production. Other areas utilizing non-hydrolytic enzymes are being developed. Use of enzymes in food processing is considered. Following an overview of uses for hydrolytic enzymes (including alpha-amylase in breads, proteinases in dough, beta-glucanase in brewing, and pectinase in vegetable and fruit processing), non-hydrolytic enzymes are examined, including glucose oxidase, lipases, lipoxygenase, **transglutaminase** and laccase. Details of enzyme suppliers are included.
SH PROCESSING
CT APPLICATIONS; ENZYMES
DED 8 Jun 2001

L3 ANSWER 18 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 543770 FROSTI
TI Incorporation of whey into process **cheese**.
IN Han X.-Q.; Spradlin J.E.
PA Kraft Foods Inc.
SO European Patent Application
PI EP 1057412 A2 20001206
AI 20000602
PRAI United States 19990603
NTE 20001206
DT Patent
LA English
SL English
AB A processed **cheese** has increased content of whey proteins and lactose. The whey and milk proteins are crosslinked through the action of **transglutaminase** prior to blending with **cheese**.
SH DAIRY PRODUCTS
CT **CHEESE**; CROSS LINKING; DAIRY PRODUCTS; ENZYMES; EUROPEAN PATENT; MILK PROTEIN; PATENT; PROCESSED **CHEESE**; PROTEIN; **TRANSGLUTAMINASE**; WHEY PROTEIN
DED 2 Feb 2001

L3 ANSWER 19 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 543769 FROSTI
TI Process for incorporating whey proteins into **cheese** using **transglutaminase**.
IN Han X.-Q.; Spradlin J.E.
PA Kraft Foods Inc.
SO European Patent Application
PI EP 1057411 A2 20001206
AI 20000602
PRAI United States 19990603
NTE 20001206
DT Patent
LA English
SL English
AB A **cheese** curd contains a substantial amount of whey protein products and curded proteins originating from a dairy liquid comprising casein. The whey protein is modified using **transglutaminase**, which is then blended with a second dairy liquid and renneted to produce the curd. The curd can be used to prepare **cheese** products.
SH DAIRY PRODUCTS
CT CASEIN; **CHEESE** PRODUCTS; CURD; DAIRY PRODUCTS; ENZYMES; EUROPEAN PATENT; MILK PROTEIN; PATENT; PROTEINS; **TRANSGLUTAMINASE**; WHEY PROTEINS
DED 2 Feb 2001

L3 ANSWER 20 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 543014 FROSTI

TI Process for making **cheese** using **transglutaminase** and a non-rennet protease.
IN Anon.
PA Kraft Foods Inc.
SO European Patent Application
PI EP 1048218 A2
AI 20000419
PRAI United States 19990427
DT Patent
LA English
SL English
AB A process for making **cheese** using **transglutaminase** and a non-rennet protease is described. Dairy liquids containing casein and whey protein may be treated with **transglutaminase** and a non-rennet protease to give a **cheese** curd containing a substantial proportion of whey protein products. **Cheeses**, soft, semi-soft or hard, may also be prepared using the process of the invention.
SH DAIRY PRODUCTS
CT **CHEESE**; CHEESEMAKING; DAIRY PRODUCTS; ENZYMES; EUROPEAN PATENT; NON RENNET PROTEASES; PATENT; PROCESSING; PROTEINASES; **TRANSGLUTAMINASE**; WHEY PROTEIN PRODUCTS
DED 25 Jan 2001

L3 ANSWER 21 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 539675 FROSTI
TI **Cheese** whey protein having improved palatability, its production and utilisation thereof.
IN Soeda T.
PA Ajinomoto Co. Inc.
SO Japanese Patent Application
PI JP 2000004786 A 20000111
AI 19980624
NTE 20000111
DT Patent
LA Japanese
SL English
AB This **cheese** whey protein has improved physical properties (emulsifying, foaming, moisture retention, palatability). It has a smooth mouthfeel. A solution of whey is subjected to a **transglutaminase** treatment under specified conditions.
SH DAIRY PRODUCTS
CT DAIRY PRODUCTS; FUNCTIONAL PROPERTIES; JAPANESE PATENT; MILK PROTEIN; PATENT; PROTEIN; WHEY PROTEIN
DED 7 Dec 2000

L3 ANSWER 22 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 538934 FROSTI
TI Modifying the technological and functional properties of dairy products by enzyme-controlled methods.
AU Lorenzen P.C.
SO Deutsche Milchwirtschaft, 2000, (November 2), 51 (22), 958-960 (0 ref.)
DT Journal
LA German
AB Enzymes used in the dairy industry include peptidases, lipases, **transglutaminase**, beta-galactosidase, glucose oxidase, sulfhydryl oxidase, phosphatases and protein kinases. The article discusses their properties and applications, including the production of bioactive peptides, **cheese** flavours, and ingredients for hypoallergenic baby foods.
SH DAIRY PRODUCTS
CT ADDITIVES; APPLICATIONS; DAIRY INGREDIENTS; DAIRY PRODUCTS; ENZYMES;

FUNCTIONAL INGREDIENTS; INGREDIENTS; MILK; MILK PROTEINS; MODIFICATION; PROPERTIES; PROTEINS; **TRANSGLUTAMINASE**
DED 5 Dec 2000

L3 ANSWER 23 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 538407 FROSTI
TI Hydrocolloids. Part 2: fundamentals and applications in food, biology, and medicine.
AU Nishinari K.
SO Published by: Elsevier, Amsterdam, 2000, 487 pp
ISBN: 0-444-50178-9
DT Book
LA English
AB This book contains papers on the fundamental aspects and applications of hydrocolloids, presented at the Osaka City University International Symposium 98 - Joint meeting with the 4th International Conference on Hydrocolloids. After an introductory lecture reviewing the various and potential applications of hydrocolloids in foods and biology/medicine, there are six sections, covering the following: dispersions, emulsions and surfaces; mixed systems (rheology of gels, physical/chemical and thermal properties, phases and film formation); processing (including gum coating of **cheeses**, food emulsifiers, choux paste, sesame tofu, sugars in egg foam, and **transglutaminase**); biomedicals; nutrition (fibre, guar gum and starch and gastrointestinal function, hypocholesterolaemic effects of levan and quinoa seed, and xyloglucan and lipid metabolism); and sensory evaluation and mastication.
CT ALIMENTARY TRACT; CARBOHYDRATES; CHEMICAL PROPERTIES; CHOLESTEROL; COATINGS; DISPERSIONS; EMULSIFIERS; EMULSIONS; FIBRE; FILMS; FOAMS; GUAR GUM; GUMS; HYDROCOLLOID GELS; HYDROCOLLOIDS; INTESTINES; LIPIDS; MASTICATION; NUTRITION; PHASE TRANSITIONS; PHYSICAL PROPERTIES; POLYSACCHARIDES; PSEUDOCEREALS; QUINOA SEED; RHEOLOGICAL PROPERTIES; SENSORY ANALYSIS; STARCH; STEROLS; SURFACES; SURFACTANTS; THERMAL PROPERTIES; XYLOGLUCAN
DED 28 Nov 2000

L3 ANSWER 24 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 533416 FROSTI
TI Process for making **cheese** using **transglutaminase** and a non-rennet protease.
IN Han X.-Q.; Spradlin J.E.
PA Kraft Foods Inc.
SO United States Patent
PI US 6093424 B 20000725
AI 19990427
NTE 20000725
DT Patent
LA English
SL English
AB A **cheese** curd contains protein products originating from a dairy liquid containing casein and whey protein. The liquid is subjected to action from a **transglutaminase** and a non-rennet protease, resulting in a high proportion of whey protein products being retained in the **cheese** curd.
SH DAIRY PRODUCTS
CT **CHEESE**; CHEESEMAKING; CURD; DAIRY PRODUCTS; ENZYMES; MILK PROTEINS; PATENT; PROTEINASES; PROTEINS; **TRANSGLUTAMINASES**; US PATENT
DED 3 Oct 2000

L3 ANSWER 25 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 530842 FROSTI
TI Enzyme builds links to creative products.

AU Milo Ohr L.
SO Prepared Foods, 2000, (June), 169 (6), 75 (0 ref.)
ISSN: 0747-2536
DT Journal
LA English
AB Ajinomoto has developed a new **transglutaminase** enzyme, Activa TG. The enzyme, which is produced by microbial fermentation, is approved in the US for use in meats, poultry, seafood and **cheese**. The enzyme can be used to create new food products. It causes caseinate to gel when mixed with water. It is also improves food texture, reduces syneresis in yoghurts and modifies the mouthfeel of frozen desserts.
SH PROCESSING
CT APPLICATIONS; ENZYMES; NEW PRODUCTS; SENSORY PROPERTIES; TEXTURE; **TRANSGLUTAMINASE**
DED 23 Aug 2000

L3 ANSWER 26 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 525264 FROSTI
TI Process for producing microbial **transglutaminase**.
IN Yokoyama K.; Nakamura N.; Miwa T.; Seguro K.
PA Ajinomoto Co. Inc.
SO United States Patent
PI US 6013498 B 19990111
AI 19980702
PRAI Japan 19970704
NTE 19990111
DT Patent
LA English
SL English
AB **Transglutaminase** catalyses the acyl transfer reaction of a gamma-carboxyamido group in a peptide chain of a protein. **Transglutaminases** are used in the production of jellies, yoghurts and, **cheeses**, and for improving meat quality. This invention concerns a method for the production of a novel microbial **transglutaminase** on an industrial scale in microorganisms such as Escherichia coli. The patent application also covers a DNA encoding for a novel protein having **transglutaminase** activity; a recombinant DNA encoding for the protein; a transformant; and a process for the production of a protein with **transglutaminase** activity.
SH PROCESSING
CT ENZYMES; GENETICALLY MODIFIED MICROORGANISMS; GENETICALLY MODIFIED ORGANISMS; GENETICALLY MODIFIED **TRANSGLUTAMINASE**; MICROORGANISMS; PATENT; PRODUCTION; **TRANSGLUTAMINASE**; US PATENT
DED 23 Jun 2000

L3 ANSWER 27 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 519239 FROSTI
TI **Cheese** whey protein having improved texture, process for producing the same and use thereof.
IN Soeda T.
PA Ajinomoto Co. Inc.
SO European Patent Application
PI EP 966887 A1
AI 19990623
PRAI Japan 19980624
DT Patent
LA English
SL English
AB A process for modifying **cheese** whey protein to improve its texture is disclosed, which comprises partially denaturing the protein and treating it with a **transglutaminase**. The whey protein is preferably subjected to alkali treatment and/or preheat treatment prior

to the reaction with the **transglutaminase**. The final product is preferably in the form of a powder to increase its storage stability and to provide a convenient food ingredient.

SH DAIRY PRODUCTS

CT DAIRY PRODUCTS; DEGRADATION; DENATURATION; ENZYMES; EUROPEAN PATENT; IMPROVEMENT; INGREDIENTS; MILK PROTEIN; MODIFICATION; PATENT; PROTEIN; SENSORY PROPERTIES; TEXTURE; **TRANSGLUTAMINASE**; WHEY PROTEIN

DED 2 May 2000

L3 ANSWER 28 OF 50 FROSTI COPYRIGHT 2002 LFRA

AN 516376 FROSTI

TI Method of preparing a meat product using a **transglutaminase** containing milk product.

IN Budolfsen G.; Nielsen P.M.

PA Novo Nordisk A/S

SO European Patent Application

PI WO 956778 A1

AI 19940318

PRAI Denmark 19930319

DT Patent

LA English

SL English

AB A method for producing an acidified edible gel from milk is described. The method involves the addition of **transglutaminase** to milk, followed by heat treatment. The resulting gel has satisfactory functional and organoleptic properties. It can be used in a yoghurt mousse, **cheese**, or as a pickling liquid for meat. When used in meat, the transaminase-containing milk is injected into meat or mixed with meat immediately before the heat treatment.

SH DAIRY PRODUCTS

CT ACIDIFED MILK; AMINOTRANSFERASES; DAIRY PRODUCTS; EUROPEAN PATENT; GELS; HEATING; MEAT; MILK; PATENT; PRESERVATION

DED 16 Mar 2000

L3 ANSWER 29 OF 50 FROSTI COPYRIGHT 2002 LFRA

AN 511039 FROSTI

TI Method for cross-linking protein by using enzyme.

IN Yamaguchi S.

PA Amano Pharmaceutical Co. Ltd

SO European Patent Application

PI EP 947142 A2

AI 19990331

PRAI Japan 19980331

DT Patent

LA English

SL English

AB A novel process is described for cross-linking a protein by a multi-copper oxidase such as laccase, bilirubin oxidase, or ascorbic acid oxidase. These enzymes may be used with protein food materials to be cross-linked or gelled. Applications include raw fish or meat paste, kamaboko (fish cake), meat or fish sausages, tofu, noodles, confectionery, bread, food adhesives, yoghurt, **cheese**, and jelly. They may be used with proteins such as albumins that cannot be cross-linked with **transglutaminase**.

CT APPLICATIONS; COPPER; CROSS LINKING; ENZYMES; EUROPEAN PATENT; FISH PRODUCTS; GELATION; GELS; MEAT PRODUCTS; OXIDASES; PATENT; PROTEIN GELS; TRACE ELEMENTS

DED 7 Jan 2000

L3 ANSWER 30 OF 50 FROSTI COPYRIGHT 2002 LFRA

AN 503364 FROSTI

TI Milk whey protein-containing powder and process food obtained by using

the same.
IN Soeda T.; Yamazaki K.; Tanno H.; Kuhara C.
PA Ajinomoto Co. Inc.
SO United States Patent
PI US 5907031 B
AI 19970801
PRAI Japan 19960801
DT Patent
LA English
SL English
AB Whey protein is a waste product that is produced during **cheese** manufacture. It can be concentrated and used as a food additive. This patent describes an improved whey-protein powder and the method for manufacturing it. The whey protein is treated with **transglutaminase**, heated, which deactivates the enzyme, and dried. It has good functional properties; e.g., it acts a gelling agent and emulsifier, and produces an end product with a good texture and mouthfeel.
SH DAIRY PRODUCTS
CT DAIRY PRODUCTS; ENZYMES; MILK PROTEIN; PATENT; PROCESSING; PROTEIN; **TRANSGLUTAMINASE**; US PATENT; WHEY PROTEIN
DED 21 Sep 1999

L3 ANSWER 31 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 488988 FROSTI
TI Method for production of an acidified edible gel on milk basis.
IN Budolfsen G.; Nielsen P.M.
PA Novo Nordisk AS
SO United States Patent
PI US 5866180 B 19990202
AI 19970610
PRAI Denmark 19930319
NTE 19990202
DT Patent
LA English
SL English
AB This patent describes a gelled milk product and the method for manufacturing it. It is produced by adding **transglutaminase** to milk, which is then heated and acidified. This gives a gelled product that can be flavoured, e.g. with orange juice, and that has a good mouthfeel. This product can be used to produce a yoghurt mousse, **cheese** or a pickling liquid that can be used in the manufacture of meat and fish products.
SH DAIRY PRODUCTS
CT ACIDIFIED DAIRY PRODUCTS; ACIDIFIED MILK; DAIRY PRODUCTS; ENZYMES; GELLED DAIRY PRODUCTS; MILK GELS; PATENT; **TRANSGLUTAMINASE**; US PATENT
DED 9 Mar 1999

L3 ANSWER 32 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 488732 FROSTI
TI Process for producing microbial **transglutaminase**.
IN Yokoyama K.; Nakamura N.; Miwa T.; Seguro K.
PA Ajinomoto Co. Inc.
SO European Patent Application
PI EP 889133 A2
AI 19980702
PRAI Japan 19970704
DT Patent
LA English
SL English
AB **Transglutaminase** catalyses the acyl transfer reaction of a gamma-carboxyamide group in a peptide chain of a protein.

Transglutaminases are used in the production of jellies, yoghurts, **cheeses** and for improving meat quality. This invention concerns a method for the production of a novel microbial **transglutaminase** on an industrial scale in microorganisms such as Escherichia coli. The patent application also covers a DNA encoding for a novel protein having **transglutaminase** activity; a recombinant DNA encoding for the protein; a transformant; and a process for the production of a protein with **transglutaminase** activity.

SH PROCESSING
CT EUROPEAN PATENT; GENETICALLY MODIFIED MICROORGANISMS; GENETICALLY MODIFIED ORGANISMS; GENETICALLY MODIFIED **TRANSGLUTAMINASE**; MICROORGANISMS; PATENT; PRODUCTION; **TRANSGLUTAMINASE**
DED 8 Mar 1999

L3 ANSWER 33 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 494250 FROSTI
TI **Transglutaminases** from Oomycetes.
IN Beck L.; Rasmussen G.; Halkier T.; Okada M.; Andersen L.N.; Kauppinen M.S.; Sandal T.
PA Novo Nordisk A/S
SO European Patent Application
PI EP 871712 A1
WO 9622366 19960725
AI 19960119
PRAI Denmark 19950119
DT Patent
LA English
SL English
AB **Transglutaminases** are enzymes that are useful in a number of food-processing applications, such as for cross-linking proteins in flour, bakery products, meat and fish products, gelled food products, **cheese** and milk products; or as glutaminase enzymes in bread and other baked gluten-containing products. This patent describes a method for the high-level expression of tranglutaminases in lower fungi of the class Oomycetes, e.g. Pythium sp. and Phytophthera sp. A recombinant **transglutaminase** has also been cloned and expressed.
SH PROCESSING
CT ENZYMES; EUROPEAN PATENT; FUNGI; GENETIC MODIFICATION; MICROORGANISMS; OOMYCETES; PATENT; PRODUCTION; **TRANSGLUTAMINASE**
DED 17 Jan 1999

L3 ANSWER 34 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 481921 FROSTI
TI Properties and potential fields of application of **transglutaminase** preparations in dairying.
AU Lorenzen P.C.; Schlimme E.
SO Bulletin of the International Dairy Federation, No.332, Published by: IDF, Brussels, 1998, 47-53 (37 ref.)
International Dairy Federation
DT Book Article
LA English
AB Enzymic modification of proteins is increasingly used in the preparation of foods and functional ingredients. The properties and potential applications of **transglutaminase** preparations in the dairy industry are described. The reactions catalysed by **transglutaminase** and the properties of the modified proteins are outlined. The influence of cross-linking on the properties of selected milk proteins and products (yoghurt, skimmed milk, whipping cream) is considered. It was concluded that **transglutaminase** might be used in stabilizing products such as yoghurt, whipping cream, fresh **cheese** and novel milk products. The use of cross-linked caseinates as functional ingredients in food systems may also be

feasible.
SH DAIRY PRODUCTS
CT CASEINATES; **CHEESE**; CREAM; CROSS LINKING; DAIRY PRODUCTS; ENZYMES; FERMENTED DAIRY PRODUCTS; FERMENTED FOODS; FUNCTIONAL PROPERTIES; MILK PROTEIN; MODIFICATION; PROTEIN; **TRANSGLUTAMINASE**; WHIPPING CREAM; YOGHURT
DED 10 Dec 1998

L2 ANSWER 35 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 481915 FROSTI
TI Bulletin of the International Dairy Federation, No.332.
AU International Dairy Federation
SO Published by: IDF, Brussels, 1998, 68pp
IDF Bulletin, No.332
DT Book
LA English
AB This Bulletin contains the proceedings of the Conference of Commission B on 'The use of enzymes in dairying' held in Reykjavik, Iceland in 1997. These proceedings contain the following papers: milk-clotting activity of various rennets and coagulants; background and information regarding IDF standards; the mechanism of rennet retardation in **cheese**; the enzymatic breakdown of milk proteins during **cheese** ripening; the influence of heat treatment of milk on the activities of the indigenous milk enzymes alkaline phosphatase and adenosine deaminase; the inhibition of bacterial growth in whey by the activation of lactoperoxidase; and the properties and potential fields of application of **transglutaminase** preparations in dairying. The Bulletin also contains two further papers. The first is a literature survey on the application of Fourier-transform infrared spectroscopy in milk-product analysis. The second paper is entitled Fourier-transform infrared spectroscopy: a new concept for milk and milk-product analysis.
CT ADENOSINE DEAMINASE; ALKALINE PHOSPHATASE; ANALYSIS; BACTERIA; **CHEESE**; COAGULANTS; COAGULATION; DAIRY INDUSTRY; DAIRY PRODUCTS; ENZYMES; FOOD INDUSTRY; FOURIER TRANSFORM SPECTROSCOPY; HEATING; IDF; INHIBITION; LACTOPEROXIDASE; MICROORGANISMS; MILK; MILK PRODUCTS; PROTEINS; RENNET; REVIEW; RIPENING; SPECTROSCOPY; STANDARDS; **TRANSGLUTAMINASE**; WHEY
DED 10 Dec 1998

L2 ANSWER 36 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 476381 FROSTI
TI Milk whey protein-containing powder and processed food using the same.
IN Soeda T.; Yamazaki K.; Tanno H.; Kuhara T.
PA Ajinomoto Co. Inc.
SO Japanese Patent Application
PI JP 10042792 A 19980217
AI 19960801
NTE 19980217
DT Patent
LA Japanese
SL English
AB This milk whey protein-containing powder retains its gel-forming ability and emulsion-forming capacity. The production method is described. A solution containing whey protein, such as the by-product of **cheese** production, is acted upon by a **transglutaminase**. The solution is then heated to 100-140 C, followed by drying.
SH ADDITIVES
CT DAIRY PRODUCTS; JAPANESE PATENT; MILK PROTEIN; MILK PROTEIN CONCENTRATE; PATENT; PRODUCTION; PROTEIN; PROTEIN PRODUCTS; WHEY PRODUCTS; WHEY PROTEIN; WHEY PROTEIN CONCENTRATE
DED 23 Sep 1998

L3 ANSWER 37 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 468823 FROSTI
TI A process for making **cheese**.
IN Budtz P.
PA Novo Nordisk A/S
SO European Patent Application
PI EP 835061 A1
WO 9701961 19970123
AI 19960625
PRAI Denmark 19950630
DT Patent
LA English
SL English
AB The patent describes a method for making **cheese** from cheesemilk that has been pretreated with an enzyme, which is able to maintain proteins in the **cheese** material during the **cheese** making process, so that increased yields of **cheese** are obtained. The enzyme used is **transglutaminase**, which is capable of increasing the amount of protein left in the coagulated **cheese** material after incubation with rennet, and after the separation of whey from coagulate. The method involves adding **transglutaminase** to cheesemilk and incubating for a suitable period; incubating with rennet to cause clotting; separating the whey from the coagulate; and processing the coagulate into **cheese**.
SH DAIRY PRODUCTS
CT **CHEESE**; ENZYMES; EUROPEAN PATENT; INCREASE; PRODUCTION; PROTEIN; QUANTITY; **TRANSGLUTAMINASE**; YIELDS
DED 9 Jun 1998

L3 ANSWER 38 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 464990 FROSTI
TI Production of new noodle.
IN Yamazaki K.; Soeda T.
PA Ajinomoto Co. Inc.
SO Japanese Patent Application
PI JP 09154512 A 19970617
AI 19951207
NTE 19970617
DT Patent
LA Japanese
SL English
AB Noodles are described that have increased viscoelasticity with stiffness and good palatability and taste. A raw material containing partially decomposed proteins, which are mainly proteins other than wheat protein, is incorporated and reacted with preferably 0.1-10 units (based on 1 g protein) of a **transglutaminase**. The obtained mixture is kneaded to form a noodle dough. The noodles are soya bean, fish, rice, bean curd, egg, milk, **cheese** or gelatin noodles.
CT JAPANESE PATENT; NOODLES; PRODUCTION; RHEOLOGICAL PROPERTIES; **TRANSGLUTAMINASE**
DED 9 Apr 1998

L3 ANSWER 39 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 462160 FROSTI
TI Binding composition comprising **transglutaminase** and collagen, and process for producing bound food products.
IN Chiya K.; Takahiko S.
PA Ajinomoto Co. Ltd
SO European Patent Application
PI EP 815742 A2
AI 19970622
PRAI Japan 19960701; 19970526

DT Patent
LA English
SL English
AB A novel enzyme preparation is described for binding raw food materials. It does not use casein and so avoids the concerns relating to allergy. It uses a **transglutaminase** and collagen. The preparation can be used for any proteinaceous material, including meat and fish products, **cheese**, noodles or processed products. Examples of its application are described. They include the production of bound pork, fried pork cutlet with powder coating, and processed chicken tender meat fillet.
CT BINDING AGENT; CASEIN FREE; ENZYMES; EUROPEAN PATENT; MEAT PRODUCTS; REFORMED FISH PRODUCTS; REFORMED MEAT PRODUCTS; REFORMED PROCESSED PROTEIN PRODUCTS
DED 26 Feb 1998

L3 ANSWER 40 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 458219 FROSTI
TI Process for producing **cheese** using **transglutaminase**.
IN Kuraishi C.; Sakamoto J.; Soeda T.
PA Ajinomoto Co. Inc.
SO United States Patent
PI US 5681598 B 19971028
AI 19951026
PRAI Japan 19941026
NTE 19971028
DT Patent
LA English
SL English
AB A process for producing natural **cheese** is disclosed, which incorporates a **transglutaminase** reaction. The process produces a greater quantity of **cheese** curd then is produced by conventional methods. The **cheese** produced is claimed to have an excellent flavour, texture and appearance. The **transglutaminase** can be added before, after or at the same time as the milk-clotting enzyme is added to the milk or milk protein.
SH DAIRY PRODUCTS
CT **CHEESE**; **CHEESE** CURD; PROCESSING; **TRANSGLUTAMINASE**; US PATENT
DED 19 Dec 1997

L3 ANSWER 41 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 455111 FROSTI
TI Method for production of a non acidified edible gel on milk basis.
IN Budolfsen G.; Nielsen P.M.
PA Novo Nordisk A/S
SO United States Patent
PI US 5670192 B 19970923
AI 19940318
PRAI Denmark 19930319
NTE 19970923
DT Patent
LA English
SL English
AB The production of an edible gel with good functional and/or sensory properties is disclosed, which can be used as a mousse or pudding without requiring the addition of emulsifying or stabilizing agents. The gel is obtained by adding **transglutaminase** and rennet to milk, followed by a heat treatment. The rennet does not exert its normal function and cause a separation of the milk into a **cheese** phase and a whey phase, but produces a single-phase gel product.
SH DAIRY PRODUCTS

CT DAIPY DESSERTS; DAIPY PRODUCTS; DESSERTS; EDIBLE GELS; GELS; RENNET; **TRANSGLUTAMINASE**; US PATENT
DED 18 Nov 1997

L3 ANSWER 42 OF 50 FPOSTI COPYRIGHT 2002 LFRA
AN 438976 FROSTI
TI Enzymatic modification of food proteins to improve the functional properties.
AU Kamata Y.
SO Food proteins and lipids: proceedings of a symposium, Chicago, August 1995., Published by: Plenum Press, New York, 1997, 47-65 (52 ref.)
Damodaran S.
ISBN: 0-306-45586-2
DT Conference Article
LA English
AB An increased demand for meat products in Asia has resulted in the development of vegetable or milk protein-based simulated meat products. As the functional properties of milk and vegetable proteins are often inferior to animal proteins, improvements to the functional quality of milk and vegetable proteins are required. Improvements can be made by modifying the proteins. In this paper, the enzymic modification of milk and vegetable proteins is discussed. Consideration is given to partial proteolysis of soya bean glycinin (the effects of partial proteolysis on the structure and functional properties, such as emulsifying properties, of glycinin); partial proteolysis in the production of soya milk **cheese**; immobilized enzyme systems (enzymic cross-linking using **transglutaminase** and enzymic cross-linkage between advanced glycosylated end-products of the browning reaction with other proteins, e.g. using glycosylated egg-white beads); and protein-chitosan systems.
SH PROTEINS
CT CHITOSAN; CROSS LINKING; ENZYMES; FUNCTIONAL PROPERTIES; GLYCININ; IMMOBILIZED ENZYMES; IMPROVEMENTS; MODIFICATION; PROTEINS; PROTEOLYSIS; SOYA MILK **CHEESE**
DED 1 Jul 1997

L3 ANSWER 43 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 426458 FROSTI
TI A process for making **cheese**.
IN Budtz P.
PA Novo Nordisk A/S
SO PCT Patent Application
PI WO 9701961 A1
AI 19960625
PRAI Denmark 19950630
DT Patent
LA English
SL English
AB The patent describes a method for making **cheese** from cheesemilk that has been pre-treated with an enzyme, which is able to maintain proteins in the **cheese** material during the **cheese** -making process, so that increased yields of **cheese** are obtained. The enzyme used is **transglutaminase**, which is capable of increasing the amount of protein left in the coagulated **cheese** material after incubation with rennet, and after the separation of whey from coagulate. The method involves adding **transglutaminase** to cheesemilk and incubating for a suitable period; incubating with rennet to cause clotting; separating the whey from the coagulate; and processing the coagulate into **cheese**.
SH DAIRY PRODUCTS
CT **CHEESE**; INCREASE; PCT PATENT; PRODUCTION; **TRANSGLUTAMINASE**; YIELDS
DED 1 Apr 1997

L3 ANSWER 44 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 426035 FROSTI
TI Production of **cheese** using **transglutaminase**.
IN Kuraishi T.; Sakamoto J.; Soeda T.
PA Ajinomoto Co. Inc.
SO Japanese Patent Application
PI JP 08173032 A 19960709
AI 19950601
NTE 19960709
DT Patent
LA Japanese
SL English
AB A solution containing milk or milk protein is treated with a specified concentration of **transglutaminase**. The enzyme is then deactivated by heat treatment at 72-75 C for 15 seconds to 2 minutes. The resulting substance is then treated with a milk-coagulation enzyme to produce **cheese** with the same texture and flavour as conventional **cheese**. The **transglutaminase** treatment increases the weight of curd produced without damage to the texture of the finished **cheese**.
SH DAIRY PRODUCTS
CT ADDITIVES; **CHEESE**; **CHEESE** CURD; CURDS; HEATING; JAPANESE PATENT; MILK; MILK CURD; MILK PROTEIN; MILK PROTEINS; PROCESSING; PRODUCTION; PROTEINS; TEXTURE; **TRANSGLUTAMINASE**
DED 27 Feb 1997

L3 ANSWER 45 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 425722 FROSTI
TI Process for efficiently producing trans-glutaminase through DNA recombination.
IN Yokoyama K.; Kikuchi Y.; Yasueda H.
PA Ajinomoto Co. Inc.
SO European Patent Application
PI EP 743365 A2
DS DE; FR; GB; IT
AI 19960517
PRAI Japan 19950517
DT Patent
LA English
SL English
AB **Transglutaminase** (TG) can be used to produce food gels and has applications in the manufacture of yoghurt, jelly, **cheese** and the like. A process is proposed for producing large quantities of TG at low cost using E. coli expressing recombinant TG derived preferably from fish, e.g red sea bream.
SH ADDITIVES
CT BACTERIA; DNA; E COLI; EUROPEAN PATENT; MICROORGANISMS; PRODUCTION; RECOMBINANT; **TRANSGLUTAMINASE**
DED 6 Feb 1997

L3 ANSWER 46 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 418131 FROSTI
TI A cross-linking approach for studying mutual spatial relationships of protein components in **cheese**.
AU Faghi A.; Turin L.; Bonomi F.
SO Milchwissenschaft, 1996, 51 (8), 442-446 (20 ref.)
DT Journal
LA English
SL English; German
AB Cross-linkages between amino acid side chains of proteins may be formed by the enzyme **transglutaminase** or by other molecules containing

two reactive groups. This paper reports the use of glutaraldehyde for cross-linking casein micelle protein components in milk and in commercial **cheese** samples. In raw milk, alpha(s)-casein and beta-casein had similar reactivities with glutaraldehyde, but whey proteins were unreactive. In the **cheeses** studied (Mozzarella, Caciotta, Taleggio, and processed **cheese**), beta-casein and para-kappa-casein were sensitive indicators of changes in micellar structure during **cheese** ripening.

SH DAIRY PRODUCTS
CT CASEIN; CASEIN MICELLES; **CHEESE**; CROSS LINKING; GLUTARALDEHYDE; MICELLES; MILK; MILK PROTEIN; MILK PROTEINS; PROTEINS; RIPENING; STRUCTURE; TYPE
DED 19 Sep 1996

L3 ANSWER 47 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 416467 FROSTI
TI **Transglutaminases** from oomycetes.
IN Bech L.; Rasmussen G.; Halkier T.; Andersen L.N.; Kauppinen M.S.; Sandal T.
PA Novo Nordisk AS
SO PCT Patent Application
PI WO 9622366 A1
AI 19960119
PRAI Denmark 19950119
DT Patent
LA English
SL English
AB **Transglutaminases** are enzymes that are useful in a number of food-processing applications, such as for cross-linking proteins in flour, bakery products, meat and fish products, gelled food products, **cheese** and milk products; or as glutaminase enzymes in bread and other baked gluten-containing products. This patent describes a method for the high-level expression of tranglutaminases in lower fungi of the class Oomycetes, e.g. Pythium sp. and Phytophthera sp. A recombinant **transglutaminase** has also been cloned and expressed.
SH PROCESSING
CT ENZYMES; OOMYCETES; PCT PATENT; PROCESSING; PRODUCTION; **TRANSGLUTAMINASE**
DED 3 Sep 1996

L3 ANSWER 48 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 411086 FROSTI
TI Method for production of an acidified edible gel on milk basis, and use of such gel.
IN Budolfsen G.; Nielsen P.M.
PA Novo Nordisk A/S
SO European Patent Application
PI EP 589383 A1
WO 9421129 19940929
DS AT; BE; CH; DE; DK; ES; FR; GB; GR; IE; IT; LI; LU; NL; PT; SE
AI 19940318
PRAI Denmark 19930319
DT Patent
LA English
SL English
AB A method is disclosed for producing an acidified, low-protein, milk-based gel with a pleasant consistency. **Transglutaminase** is added to milk or a milk-like product, the pH is adjusted to 4.8-5.8, and the product is heated, e.g., in a microwave oven. Improved organoleptic properties can be achieved by also heating the product after addition of the **transglutaminase**. The **transglutaminase** can be of human, bovine or microbial origin. Flavourings, such as orange juice,

can be added to the milk. Gels made by this method have a variety of applications, including mousses, **cheese**, and pickling liquids for meat. When used as a pickling liquid, the gel is injected into the meat or mixed with it prior to heat treatment. An advantage of the invention is that no emulsifiers or stabilisers are required for the gel. See also EP 0 689 384 (WO 94/21130), in which rennet is also added to the milk mixture. Non-acidified gels are produced, which can be used for desserts such as a chocolate or vanilla mousse.

SH DAIRY PRODUCTS
CT DAIRY DESSERTS; DAIRY PRODUCTS; DESSERTS; EUROPEAN PATENT; GELS; LOW PROTEIN; MILK; MILK GELS; PRODUCTION; **TRANSGLUTAMINASE**
DED 19 Jun 1996

L3 ANSWER 49 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 410135 FROSTI
TI Process for producing **cheese** using **transglutaminase**.
IN Kuraishi C.; Sakamoto J.; Soeda T.
PA Ajinomoto Co. Inc.
SO European Patent Application
PI EP 711504 A1
DS DE; FR; GB; IT
AI 19951026
PRAI Japan 19941026; 19950601
DT Patent
LA English
SL English
AB A method is disclosed for production of natural **cheese** by which the enzyme **transglutaminase** (TG) is added to a solution containing milk or milk protein. The mixture is then heat-treated, and a milk-clotting enzyme is added. It is claimed that the process can provide large amounts of **cheese** curd compared with conventional methods. The **cheese** so produced is said to have a good flavour, taste and appearance.
SH DAIRY PRODUCTS
CT **CHEESE**; ENZYMES; EUROPEAN PATENT; PRODUCTION; **TRANSGLUTAMINASE**
DED 19 Jun 1996

L3 ANSWER 50 OF 50 FROSTI COPYRIGHT 2002 LFRA
AN 327265 FROSTI
TI Gene encoding **transglutaminase** derived from fish.
IN Yasueda H.; Nakanishi K.; Motoki M.; Nagase K.; Matsui H.
PA Ajinomoto Co. Inc.
SO European Patent Application
PI EP 555649 A2
DS DE; FR; GB; IT
AI 19930114
PRAI Japan 19920114; 19920727; 19921208
DT Patent
LA English
SL English
AB **Transglutaminase** (TGase) is used in the production of gelatinous food products, such as yoghurt, jelly, and **cheese**. A gene encoding TGase derived from fish, a transformant into which this plasmid is introduced, and a method for the production of fish-derived polypeptide possessing TGase activity by culturing of the transformant, are described.
SH PROCESSING
CT FISH; GELATINOUS FOOD; GENES; GENETIC ENGINEERING; PATENTS; POLYPEPTIDES; PRODUCTION; TRANSFORMANT; **TRANSGLUTAMINASE**
DED 28 Oct 1993